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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hiroaki Matsuyama

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EXAMINER

NGO, HUYEN LE

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/533,075

Applicant(s)

MATSUYAMA ET AL.

Examiner

Julie-Huyen L. Ngo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: .  |

## DETAILED ACTION

### *Specification*

The specification is objected to as failing to provide proper antecedent basis for the following claimed subject matters. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

Correction of the following is required:

In claims 1 and 9, "at least one aperture formed along the boundary between adjacent differently oriented regions,"

In claims 12 and 23, the width of the aperture is longer or greater than the expected width of the defectively oriented region in a boundary. However, the specification (bridging paragraph of pages 18-19) only discloses that the width of the aperture is equal to or shorter/less than the width of the defectively oriented region.

### *Drawings*

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features recited in the following claims must be shown or the features canceled from the claims. No new matter should be entered.

Claims 1, 9, 12 and 20 recite "at least one aperture along the boundary between the adjacent differently oriented regions" that means there are more than one aperture, which should be shown. However, it appears from the drawings (e.g. figs 4, 6, and 7), and the reference sign included in original claims, there is only ONE aperture (e.g. reference sign 5) formed in the electrode 3 of each pixel.

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In claims 1, 2 and 11, the longest and shortest allowable widths of said aperture that is equal to the width of the defectively oriented region in said boundary.

In claim 4, "said electrode is comprised of a broken line of a plurality of apertures along said boundary"

In claim 5, "wherein said second boundary is aligned at almost the same horizontal location as that of the boundary in the alignment layer."

In claim 7, "the shortest allowable width of said second aperture is equal to the width of a defectively oriented region".

In claim 12, a width of the at least one aperture is equal to the expected width of the defective oriented region in a boundary.

In claim 13, "the width of said aperture is equal or shorter and than the width of said boundary".

In claim 19, "the total length of said broken line of the plurality of apertures"

In claim 23, a width of the at least one aperture is equal to the width of a defective oriented region in said boundary.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 2, 8 and 11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

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Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form.

Claims 2, 8 and 11 are not further limit the allowable width of the aperture recited in claims 1, 7 and 10, respectively, since both the longest and the shortest allowable widths of said aperture or second aperture are equal to the width of said boundary or second boundary, which should be the width of the defectively oriented region in said boundary or said second boundary.

Claims 10 and 21 are objected to under 37 CFR 1.75 as being substantial duplicates of claims 3 and 1, respectively.

Claim 12 is objected because the step of forming at least one aperture along a to-be-formed boundary on an electrode cannot be formed since this boundary has not been defined than how can the aperture be formed along such boundary? Also, according to what being shown in figures 4 and 7, the apertures 5/5' are formed under the respective boundaries or in the respective electrodes 3/ 4.

Claims 17 and 18 are objected to because it appears that the aperture should be formed IN said second electrode NOT "on" said second electrode.

Claim 20 is objected to because it appears that plurality of differently oriented regions should be formed by an alignment layer NOT "of" an alignment layer.

Claims not specifically discussed above are objected as bearing the defect(s) of the claim(s) from which they depend.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4, 17 and 19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 4 recites, "said electrode is comprised of a broken line of a plurality of apertures along said boundary," which is not enable since the apertures are formed in the electrode, how can they be formed of a broken line? Also the specification was not clearly described how to form a plurality of apertures of a broken line.

Claim 17 is not enabling since the specification was not described how

Claims 17 and 19 are rejected for the same reasons as set forth above in claim 4. Also claim 19 is unclear of how the length of the broken line is determined or measured.

**The following is a quotation of the second paragraph of 35 U.S.C. 112:**

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the language in lines 1-3 of the claim appears to be incorrect because according to the drawings (e.g. figs. 4 and 7), the differently oriented regions are formed **by** (not "of") an alignment layer; the at least one aperture is formed **under a boundary** (NOT "**along the boundary**") between adjacent differently oriented regions; and the adjacent differently oriented regions are **on** (not "in") **said** (not "an") alignment layer. Claim 1 is incomplete for failing to recite the location where the electrode is supposed to be formed with respect to other elements of the LCD. Also, "the respective liquid crystal molecules," in line 5, lacks antecedence. It is unclear from the language of the claim what is considered being "the defectively oriented region" and "the shortest allowable width of said aperture".

In claim 2, it is unclear from the language of the claim what is considered being "the longest allowable width of said aperture".

In claim 3, "the liquid crystal molecules" lack antecedence.

In claim 5, the recitation calling for "said second boundary is aligned at almost the same horizontal location as that of the boundary in the alignment layer" is unclear since the horizontal location of the boundary has not been defined; and also "*the boundary in the alignment layer*" lacks antecedence. However, according to the recitation in claim 1, the boundary is NOT in the alignment layer, but between the adjacent differently oriented regions.

In claim 6, the recitation calling for "said second electrode is comprised of a second aperture that is aligned so as not to be located at the same horizontal location as that of the aperture on said electrode" is unclear since "*the horizontal location of the*

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*aperture*" has not been defined; and "the aperture on said electrode" lacks antecedence. It is unclear of which aperture and which electrode Applicant is referred to since there are at least two apertures and two electrodes recited in claims 1 and 5, respectively.

In claim 7, it is unclear from the language of the claim what considered being "a defectively oriented region" and "the shortest allowable width of said second aperture".

In claim 9, the claimed language appears to be incorrect because according to the drawings (e.g. figs. 4 and 7), the differently oriented regions are formed **by** (not "of") an alignment layer (line 2); the at least one aperture is formed **under a boundary** (NOT "**along the boundary**") between adjacent differently oriented regions (lines 2-3); and the adjacent differently oriented regions are formed **on or by** (not "in") **said** (not "an") alignment layer (lines 3-4); also in lines 4-6, the adjacent differently oriented regions DO NOT orienting the respective liquid crystal molecules; however, the alignment layer orients/aligns respective liquid crystal molecules on the differently oriented regions.

Claim 9 is incomplete as failing to recite the location where the electrode is supposed to be formed with respect to other elements of the LCD. Also, "the respective liquid crystal molecules," in line 5, lacks antecedence.

In claim 10, it is unclear from the language of the claim what considered being "a defectively oriented region" and "the shortest allowable width of said aperture".

Claim 11 is unclear of what considered being "the longest allowable width of said aperture".



In claim 12, "the expected width of the defectively oriented region," line 4, and "the resultant surface," line 6, lack antecedence.

Claim 14 is incomplete as failing to recite a reference direction or element that the liquid crystal molecules are oriented in vertical or almost vertical to.

Claim 15 is incomplete as failing to recite the location where the second electrode is supposed to be formed with respect to other elements of the LCD. Also, "the differently oriented second regions" in lines 5 and 6, lack antecedence. It is unclear which alignment layer Applicant is referred to as "said alignment layer" recited in line 7. Furthermore, it is unclear what applicant intend to recite by the recitation "such a manner that ...can horizontally fit the boundary generated in the generation step," in lines 5-8. It appears that "the generation step," in lines 7 and 8, should be "the generating step\_ \_".

Claim 20 is incomplete as failing to recite the location where the electrode is supposed to be formed with respect to other elements of the LCD. Also it appears that the aperture should be formed under the boundary between the adjacent differently oriented regions.

Claims not specifically mentioned above are rejected as bearing the defect(s) of the claim(s) from which they depend.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-3, 5, 6, 8-16, 18, 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirata et al. (US 5953093A).

Hirata et al. teach (Figs. 22 and 25; col. 18, lines 26 to col. 20, line 13) forming a LCD comprising all the limitations recited in claims 1-3, 5, 6, 8-16, 18, 20-23 including in each pixel:

- a plurality of differently oriented regions on/of an alignment layer 46a,
- an (first) electrode 44 with at least one (first) aperture 48 formed under/along the (first) boundary between adjacent differently oriented regions on said first alignment layer 46a, which is deposited on top of the said first electrode 44 and also in said first aperture 48, with said adjacent differently oriented regions orienting the respective liquid crystal molecules to be vertical or almost vertical when no electric field is applied via the said electrode
- a second electrode 45, which face said electrode 44 at a certain distance, is comprised of a second aperture 48 that is aligned so as not to be located at

the same horizontal locations as that of the first aperture of said first electrode 44 (fig. 25)

- a second alignment layer 46a, which is deposited on said second electrode 45 and is comprised of a second boundary and differently oriented regions sandwiching said second boundary, wherein said second boundary is aligned at almost the same horizontal location of the first boundary

wherein the width of the first aperture 48 is equal to the width of the defectively oriented region in said first boundary (fig. 22)

wherein the width of said second aperture 48 is equal to the width of the defectively oriented region in said second boundary (see figs. 22 and 25).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5136407 A disclose a liquid crystal display having aperture in either segment or common electrodes.

US 5963290 A discloses a liquid crystal display comprising a common electrode 32 having an aperture 34.


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US 5995176 A disclose a liquid crystal display apparatus having pixels of different orientation of liquid crystal capable of shielding leakage of light through the discontinuity of orientation.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie Ngo, whose telephone number is (703) 305-3508.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.



*Julie Huyen L. Ngo*  
**Patent Examiner**  
**Art Unit 2871**

November 26, 2002